

# US EGRT Retrofit Programs

- Caltrans Dump Truck
- International M/Y 2000 DT466 (230 hp)
- Prototype system installed February 2002
- Chassis Dyno emission testing carried out by CARB
- Operating successfully

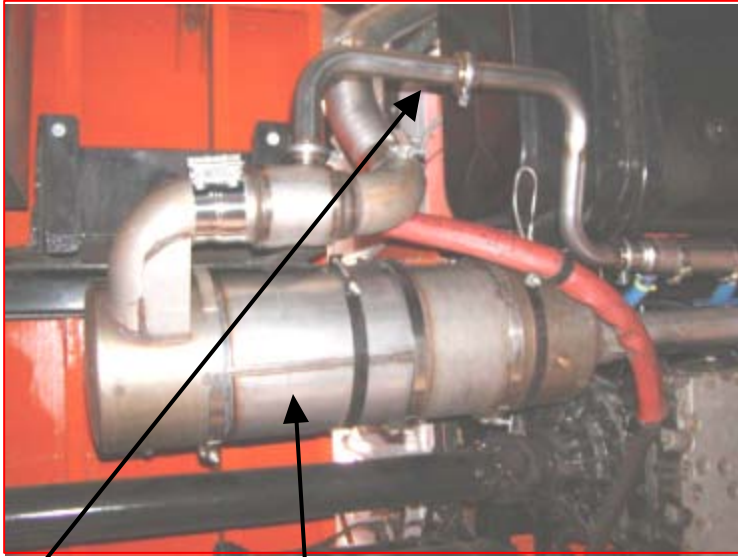
# EGRT Retrofit on Caltrans Truck



**CALTRANS Truck**

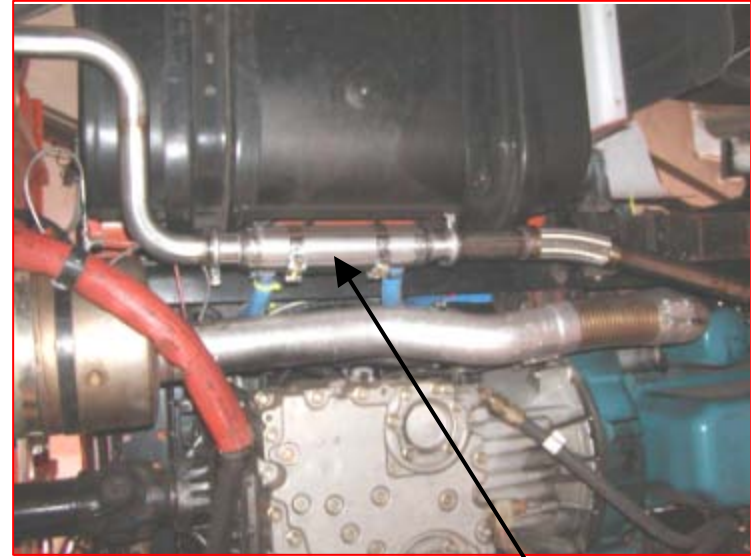


# EGRT Retrofit on Caltrans Truck

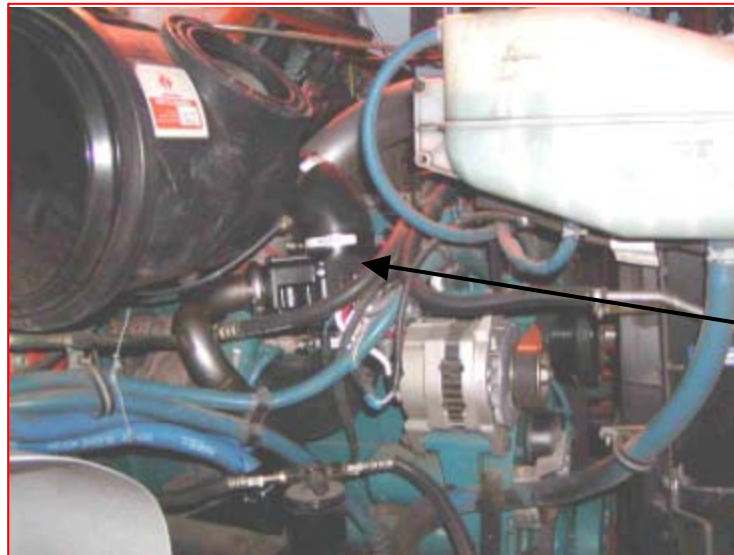


**EGR Return**

**CRT**



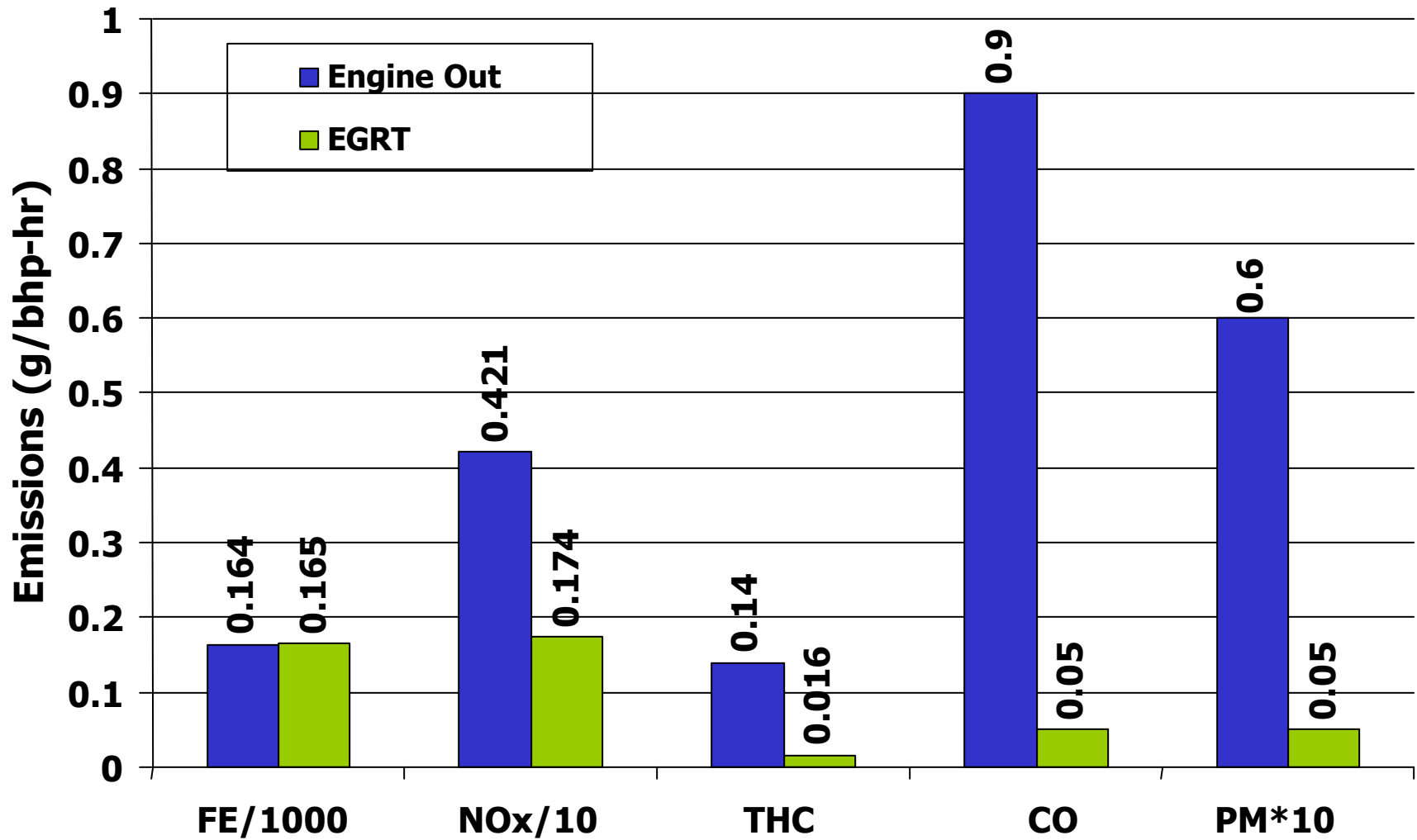
**EGR Cooler**



**EGR Valve**

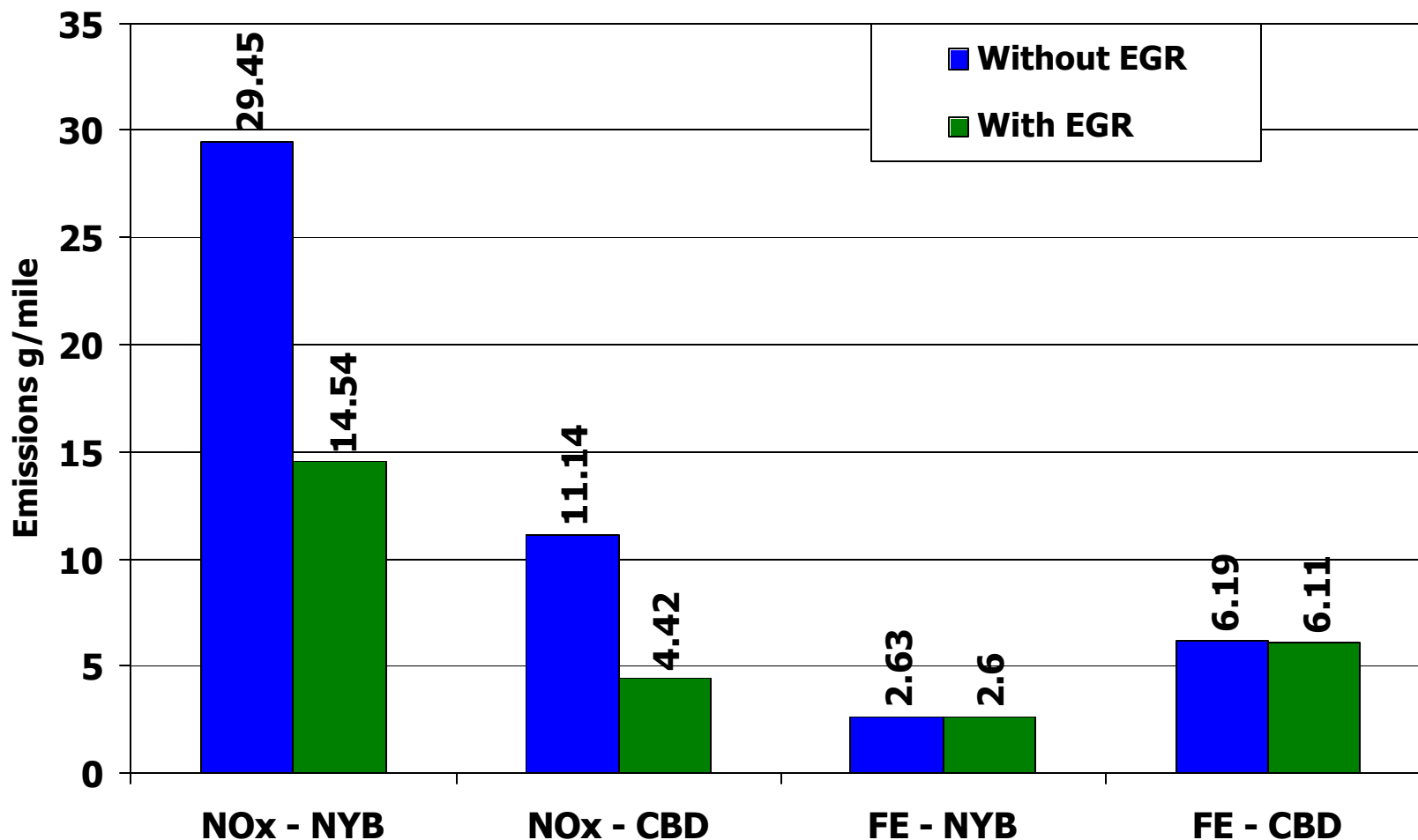
# Emissions Results for EGRT System

International DT 466 Engine, FTP Cycle on Engine Dyno



# Emissions Results for EGRT System

International DT 466 Engine Caltrans Truck on Chassis Dyno

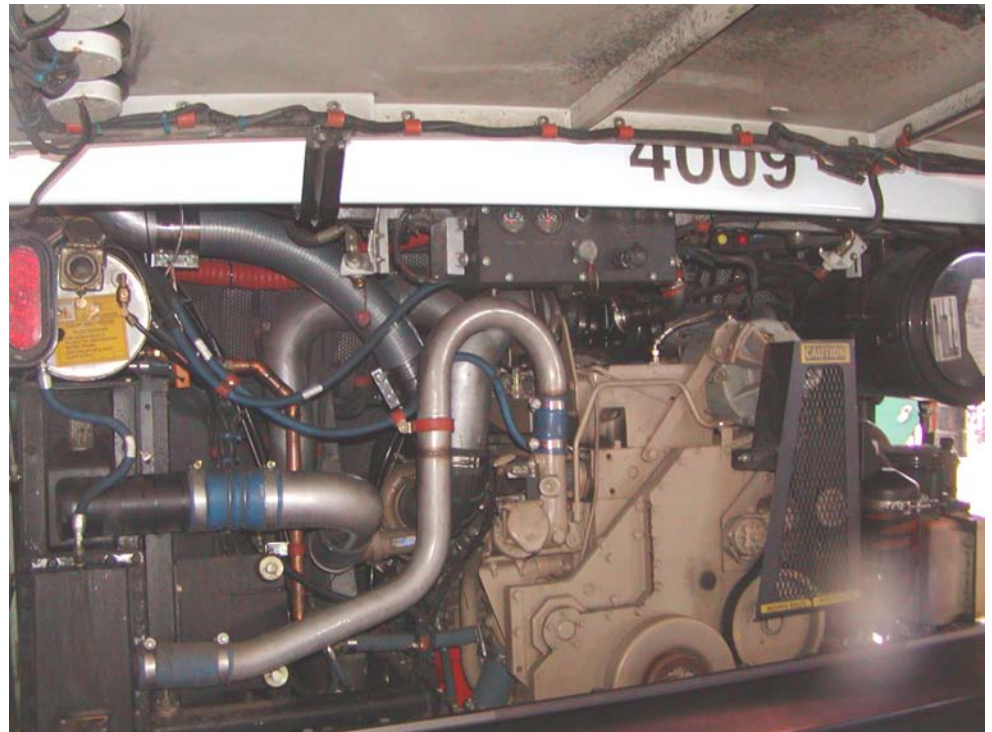


# US EGRT Retrofit Programs

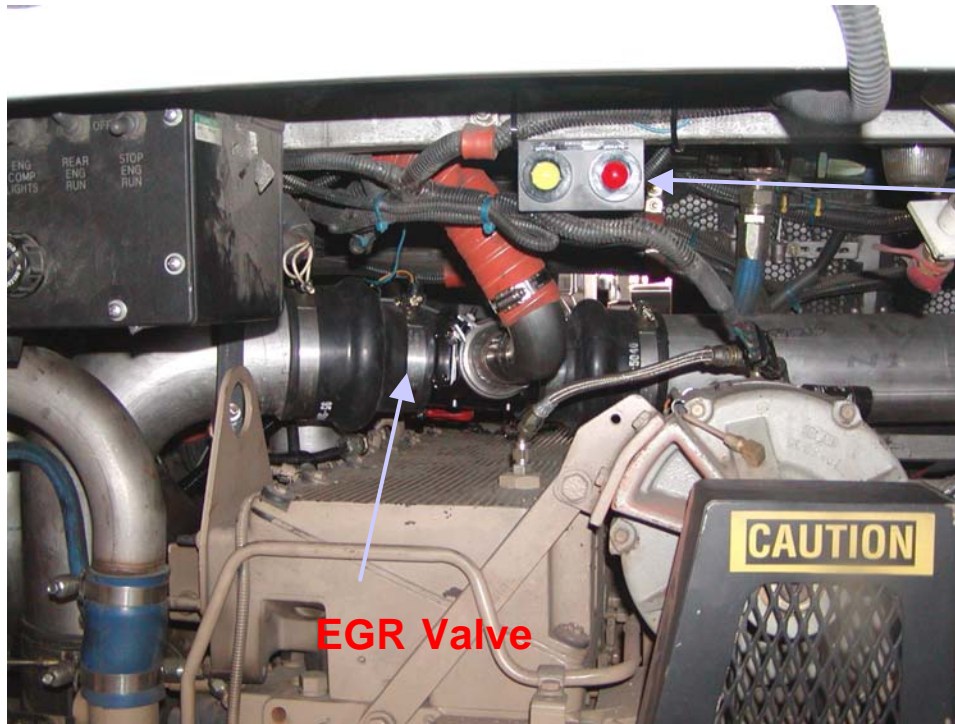
- AC Transit Bus
- Cummins M/Y 2000 ISM 280 (280 hp) engine
- Prototype system installed April 2002
- FTP Emissions on engine with EGRT
- Operating successfully



# EGRT Retrofit on AC Transit Bus



# EGRT Retrofit on AC Transit Bus



**Alarm Indicators**

**EGR Valve**



**CRT**

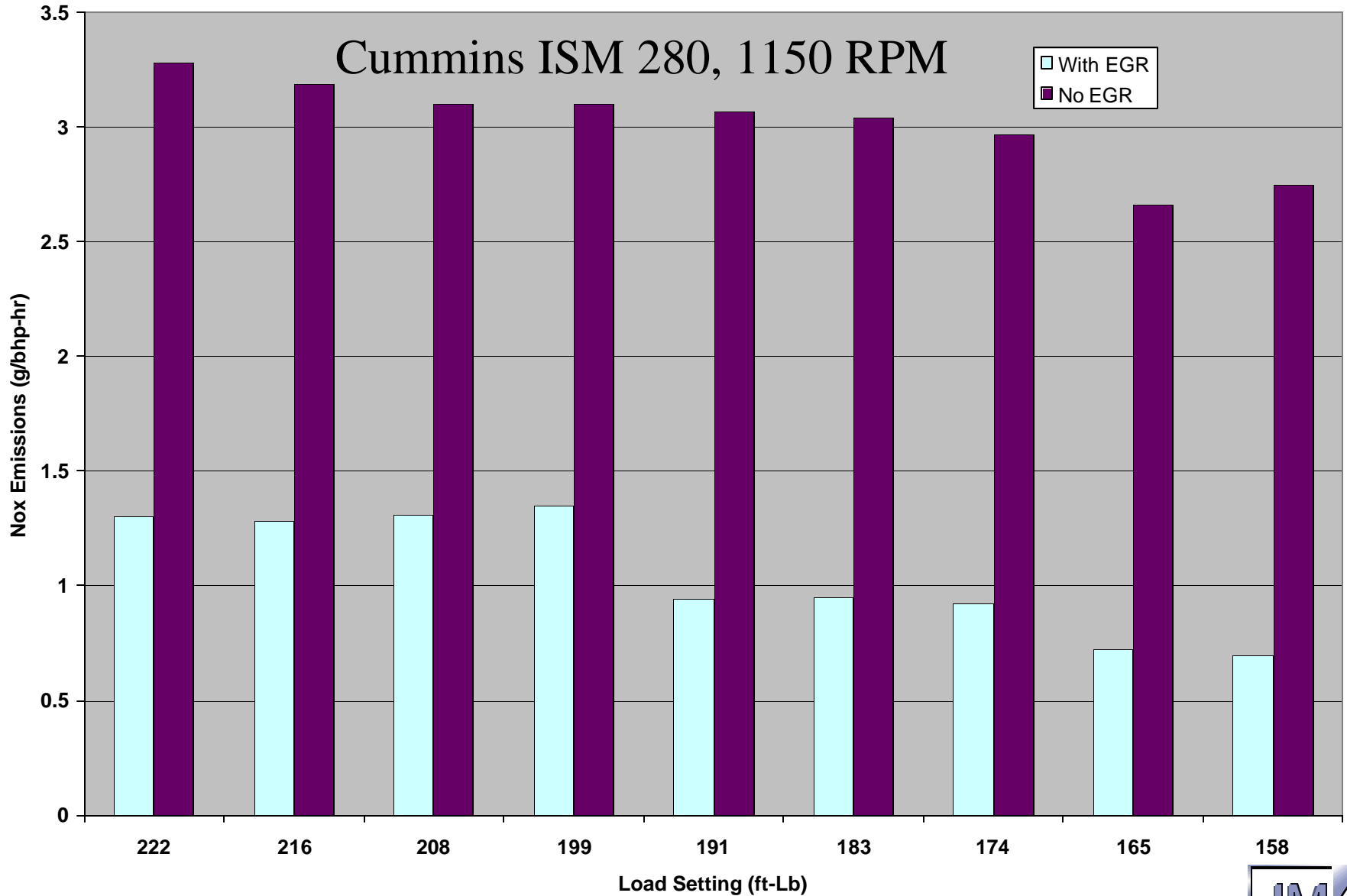
**EGR Cooler**



**CRTdm  
Monitoring**

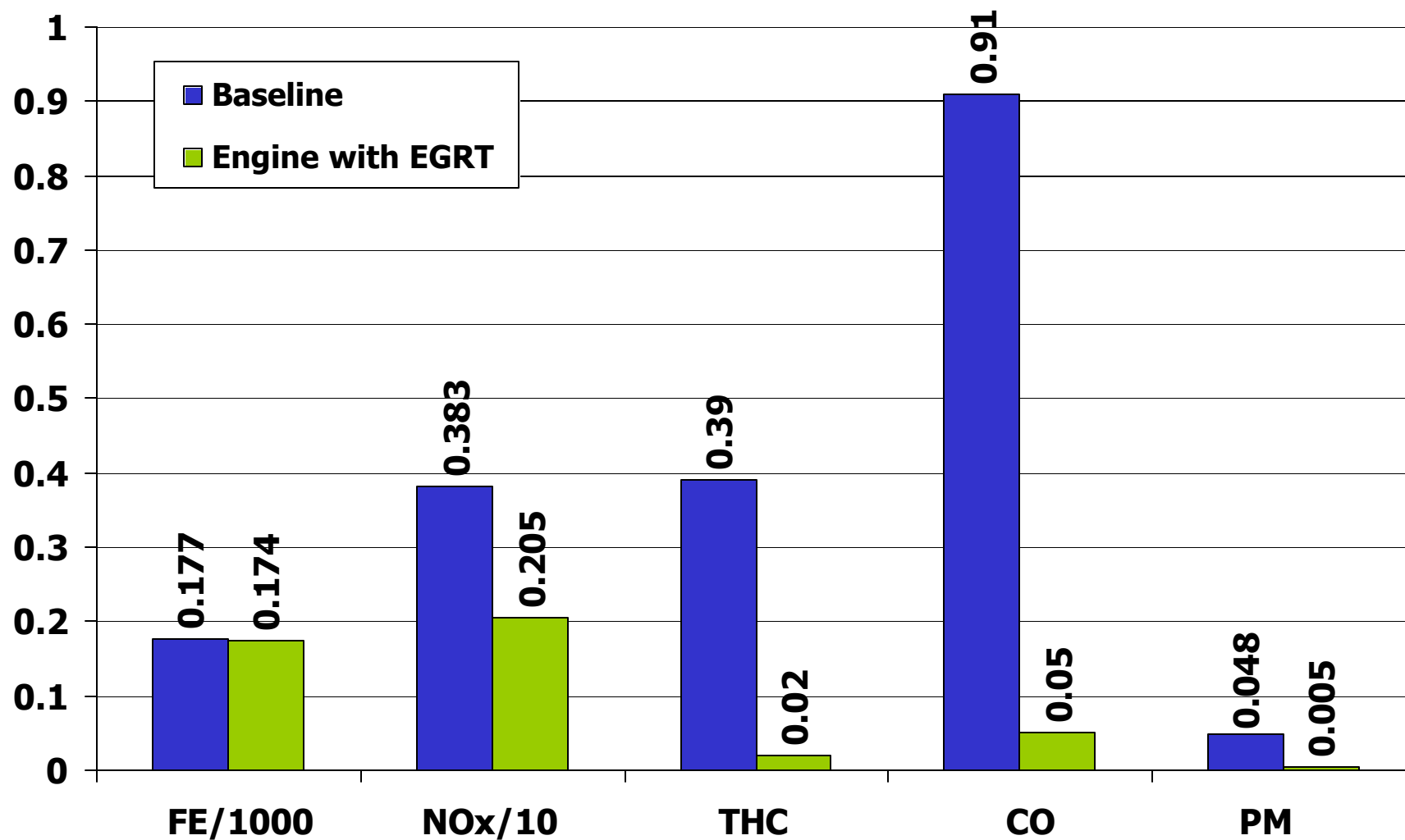


# Effect of EGR on NOx Emissions



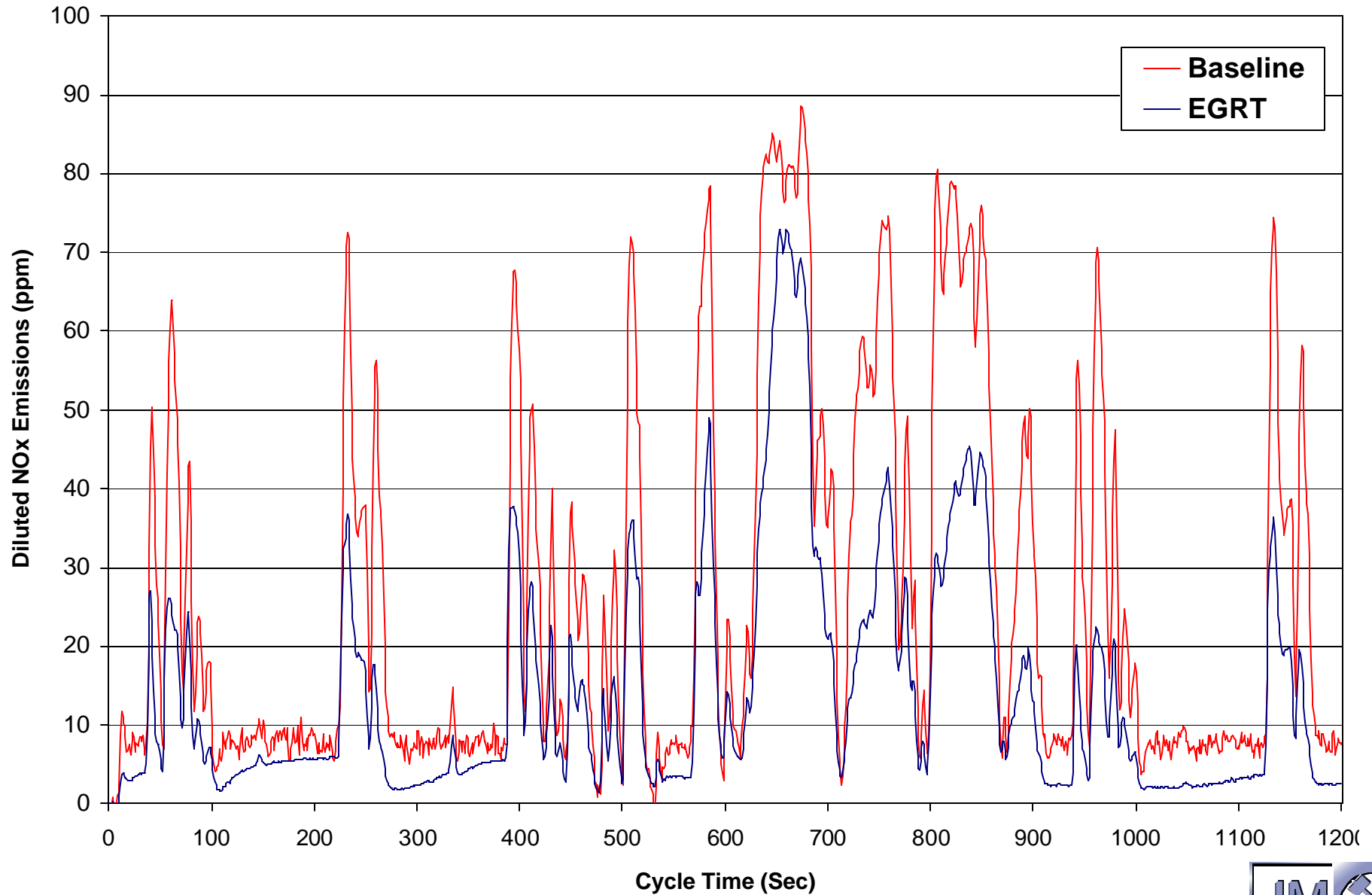
# Emissions Results for EGRT System

Cummins ISM 280 Engine, FTP Cycle on Engine Dyno



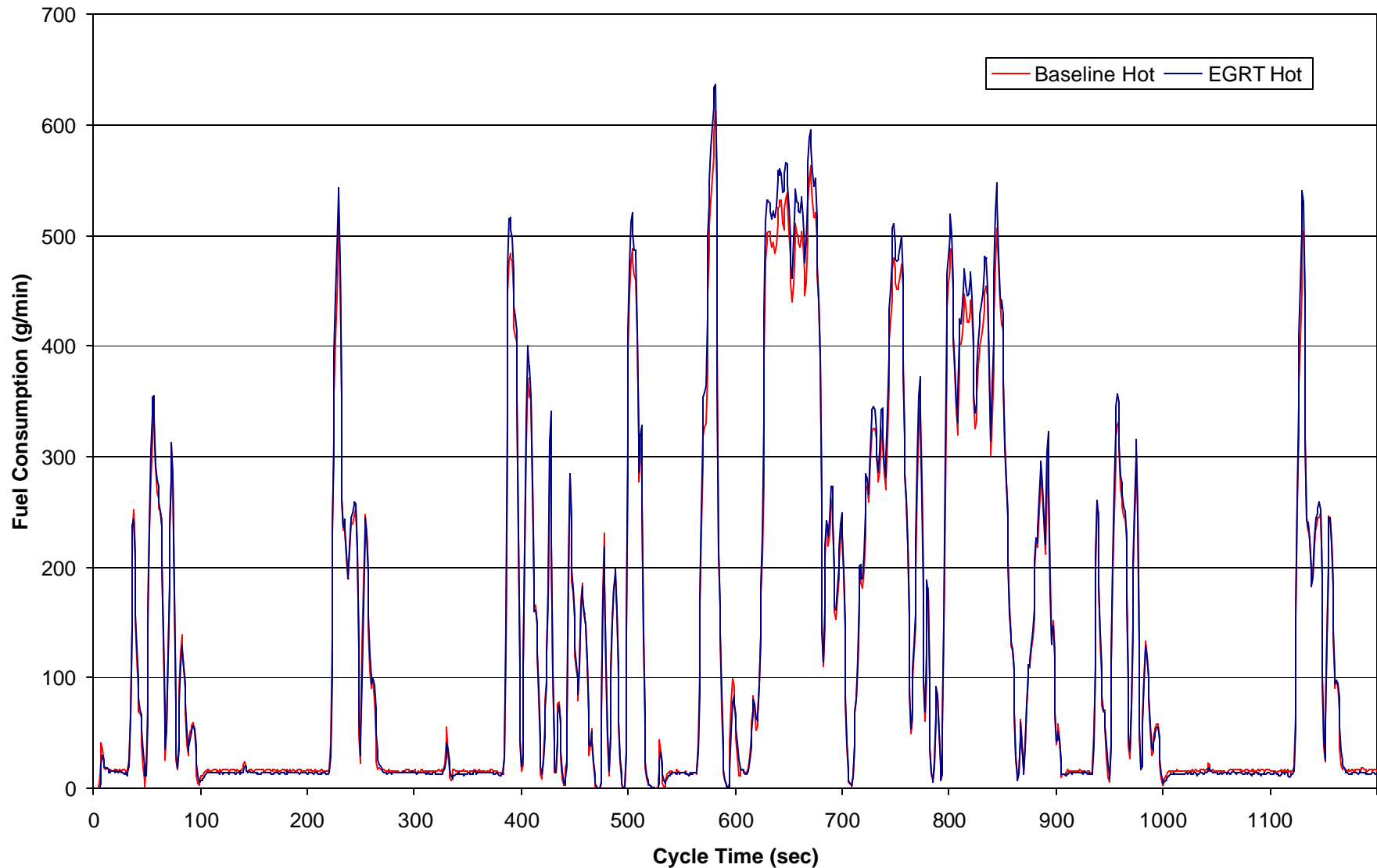
# NOx Reductions with EGRT System

## ISM 280 Bus Engine, FTP Cycle on Engine Dyno

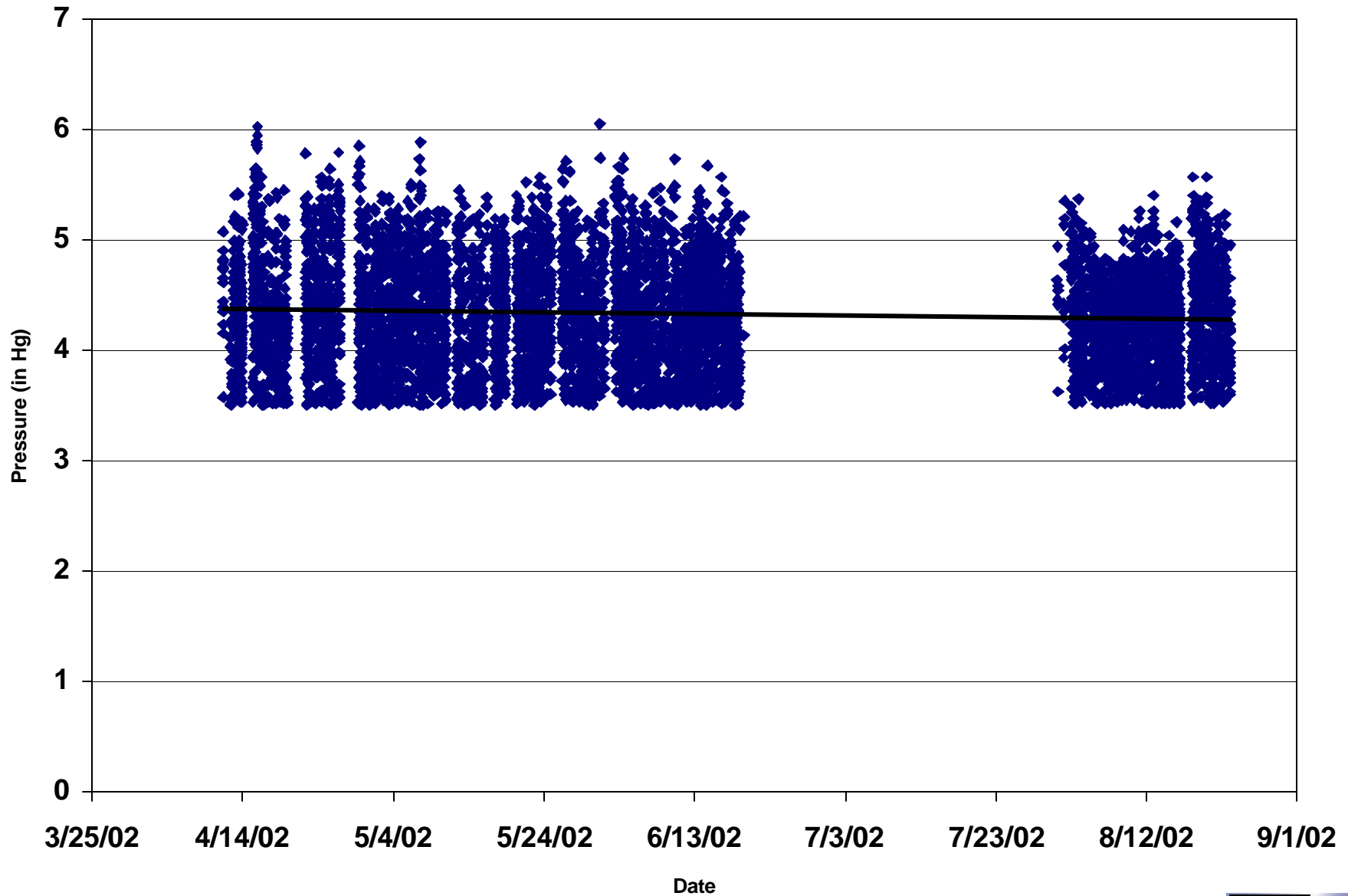


# Fuel Consumption with EGRT System

## ISM 280 BUS Engine, FTP Cycle on Engine Dyno

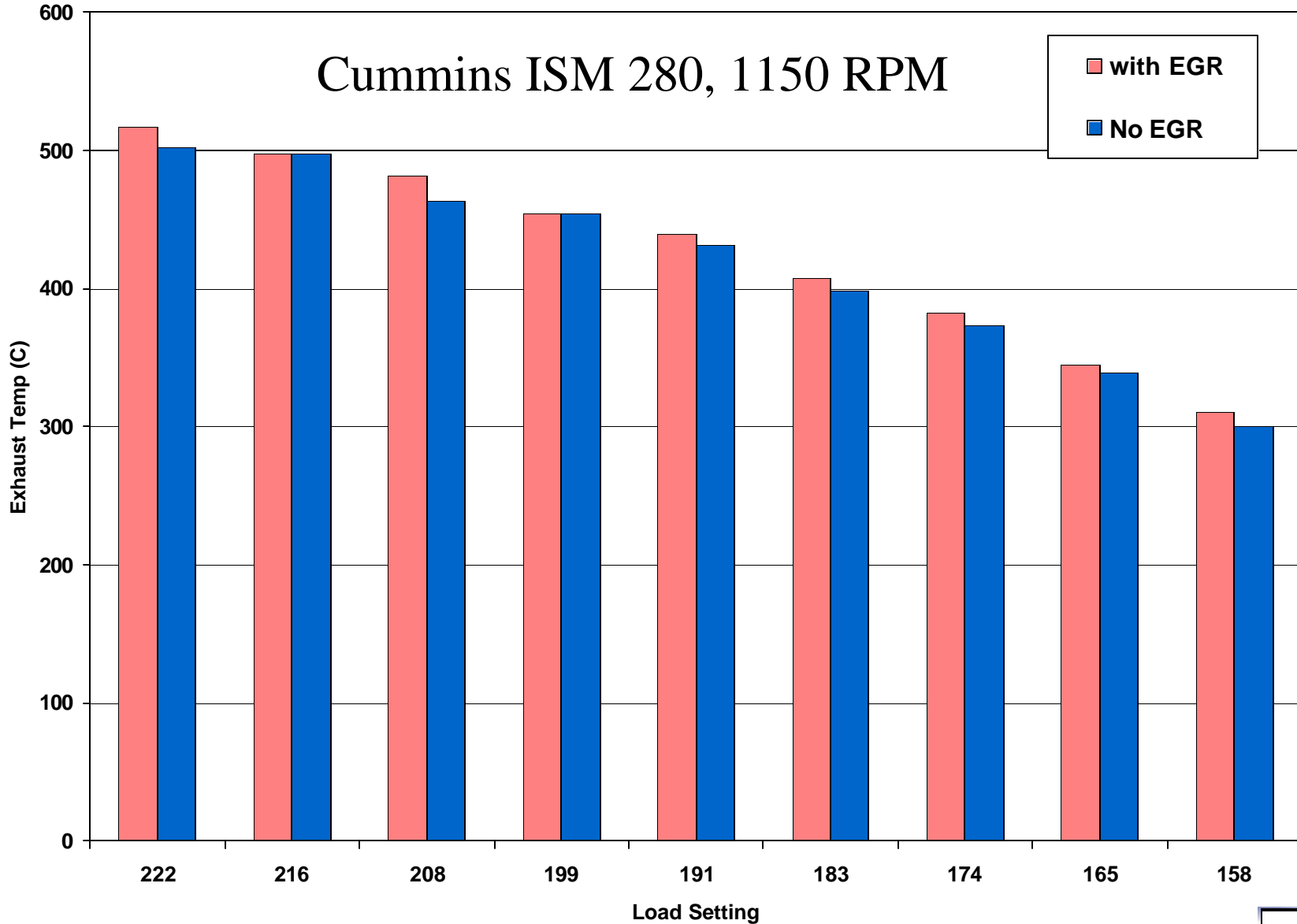


# Peak on-road Back Pressure with EGRT System

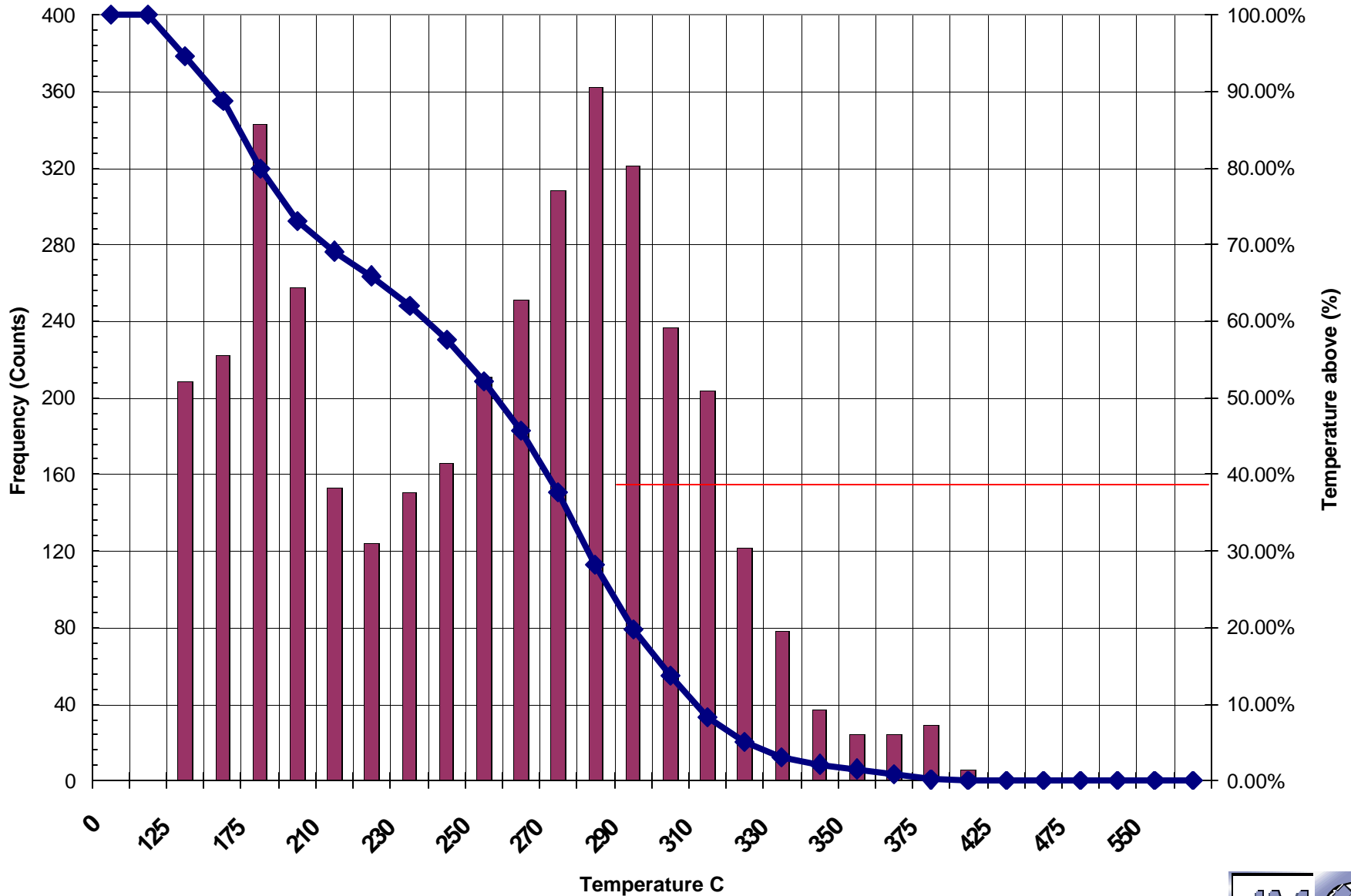




# Effect of EGR on Exhaust Temperature



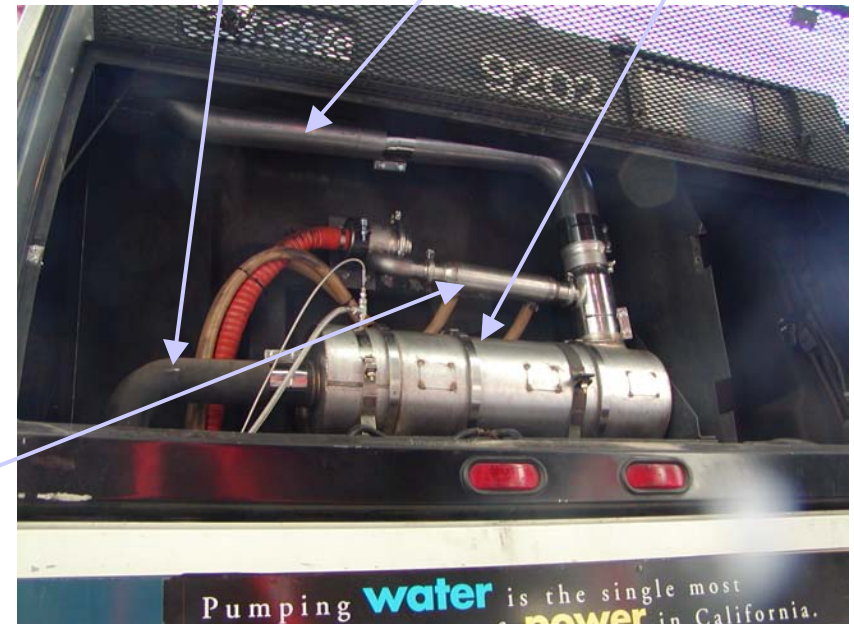
# On-road Exhaust Temperature Distribution with EGRT System



# EGRT Retrofit on VTA Transit Bus

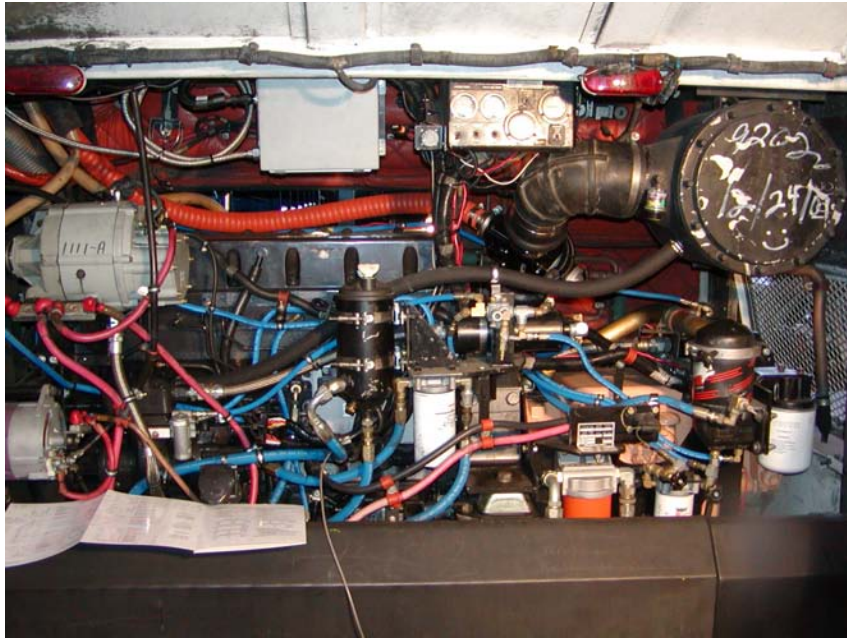


Exhaust Out Exhaust Out CRT



EGR Return

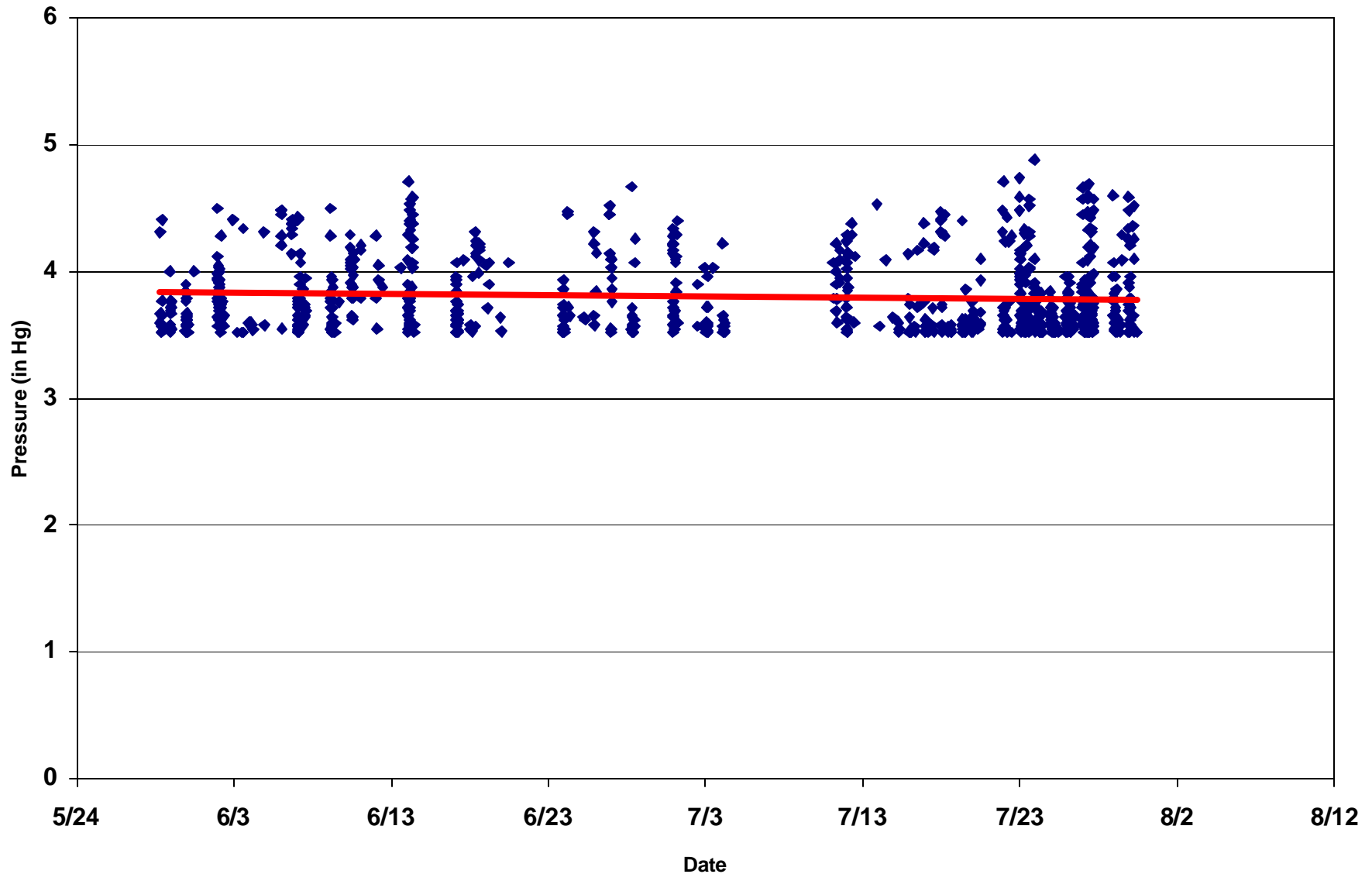
# EGRT Retrofit on VTA Transit Bus



**EGR Valve**



# Peak Back Pressure with EGRT on VTA Transit Bus





- Relatively high NOx reduction (> 40%) achievable in a retrofit system
- >90% CO, HC and PM reduction achievable
- Proven durability, over 1200 on-road; OE approved
- Engine mapping required for new engine models; Map development “key” to avoid DPF plugging
- Commercialization and CARB/EPA Verification in process
- Work with engine OE to maintain engine warranty
- JM provide training/support in co-operation with the engine OE

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